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BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

MEMORANDUM FOR THE DISTRICT FORESTER, MISSOULA, MONTANA

RE - BIG HOLE BASIN FOREST INSECT CONTROL PROJECT
October 5, 1927

PRELIMINARY REPORT TO DOCTOR CRAIGHEAD
September 14, 1927

GOVERNMENT PRINTING OFFICE

FILE COPY MISSOULA FOREST INSECT LABORATORY

Refer to File
G.C. B-11

Forest Insect Field Station
Coeur d'Alene, Idaho
October 5, 1927.

MEMORANDUM FOR THE DISTRICT FORESTER, MISSOULA, MONTANA.

Re - Big Hole Basin Forest Insect Control Project.

Though a detailed report of the past season's work in connection with the Big Hole Basin control project will be submitted at a later date, it is desired to present in this memorandum a brief synopsis of the present status of the infestation with recommendations for continuation of the project.

During August and September an extensive survey using a method of sample strips was made of the timber stands within the Big Hole Basin. These strips which were 1 chain wide and totaled 421.14 miles in length were carefully located so as to secure a fair sample of each area studied. The number of infested trees in each area was secured by multiplying the number of 1927 trees per strip acre by the total acreage in question. Though it is fully realized that there are objections to this method, it is believed to give the best extensive estimate of the status of an infestation.

The region has been divided into four areas which are outlined and marked on the attached map, each of which will be discussed separately. The figures given in this memorandum may be slightly changed in the final report of this survey but there will be no material change in the total of 1927 attacked trees.

AREA # I. Location of control work in 1927.

In this region some 19,000 trees were spotted on an area of 25,000 acres. A large number of infested trees were left untreated, due to the fact that the entire acreage was not covered by control. The data secured from the survey indicates that on an increased acreage amounting to 39,000 acres there are approximately 25,537 1927 attacked trees. On the sections covered by control work a marked reduction in the infestation over the previous season was recorded. This reduction is undoubtedly due to the control work and to the very light, if any, flight of beetles from the Bitterroot during the past season. There were sufficient 1926 attacked trees left untreated within this area to account for the present situation.

AREA # II. West side of Basin south of Battlefield R.S.

The survey data indicates that there are some 15,672 infested trees within this area. The timber is of suitable quality for insect attack and if the present situation is ignored a serious infestation will soon develop.

AREA # III. East side of Big Hole Basin.

In this area the data secured shows that there are 23,582 newly attacked trees. The infestation in this region is confined for the most part to the first two or three miles of timber within the forest boundary.

AREA # IV. Fish Trap-Wise River Area.

Based upon a count of the red top trees (1926 attack) only, it is estimated that there are apparently 3,000 - 1927 attacked trees within this area. This is a decided increase over the previous year.

Tabulation of Infestation by Areas

	1927 Attacked Trees
Area #I. 1927 control area	25,537
Area # II. West side of Basin	15,672
Area # III. East side of Big Hole Basin	23,582
Area # IV. Fish Trap-Wise River area	3,000
Total	67,791

The plan of control as agreed upon by Forest Service and Bureau of Entomology officials in 1925 was to treat all of the infested trees within the Big Hole Basin for a number of years until such a time as there was no further danger of the insects spreading from the Bitterroot. This plan was for preventing the spread of this epidemic through the lodgepole pine stands to the south and not for the protection of the timber within the Big Hole Basin. To continue this plan during the season of 1928 at least $100,000 will be required.

It is recommended that if the Big Hole Basin project is to be continued that at least $100,000 be allotted for the work in 1928. This position is taken ~~that~~ since there can be no question as to the insects flying rather long distances, which makes it very clear that the treating of an area will not protect it from the untreated ones within a few miles. To spend a smaller sum on this project would, in the writer's opinion, be money wasted with no prospects of accomplishing any results. A small sum allotted for this project would result in a retreat of our control operations to the east side of the basin and to the head of the infestations on the west side, south of the town of Jackson.

By such a move we would lose the advantage gained by the past two seasons of control work and would, in another year or two, be confronted with a situation comparable to that which now exists and would then be required to retreat once more. It has been realized since the start of this project, and so stated in all reports, that for a period of years a large sum of money would be required if the defense zone was to be held against the advance of the infestation. Apparently we have reached one of these years and it is sincerely believed that the success of the project depends upon the treating of a very large per cent of the trees within the Big Hole Basin. To attempt to forecast the future costs of carrying out the plan of control is impossible. It may prove that we are now experiencing what we have called the peak of the advance of the infestation. If such is the case then our expenditures for the 1929 season will be materially reduced. On the other hand, should we yet have to face a still heavier advance of the infestation from the Bitterroot, then a larger sum of money than has yet been requested will be required.

To prophesy the success of this project, should it be continued as planned, is a difficult task. It seems reasonable to believe that if the advance of the Bitterroot infestation into the zone of defense (Big Hole Basin) can be treated each year until such a time as the supply of beetles from adjacent untreated regions has been exhausted, its southern advance can be stopped. Under such a premise we are obliged to assume that though the beetles are able to fly rather long distances, they will not cross our zone of defense in any great numbers. However, should it prove that a larger flight of beetles than that which occurred in 1926 is yet to come from the Bitterroot, then undoubtedly it will be necessary to increase the area of our defense zone. The physical or operative side of this project is a phase which must be considered in the plans for its continuation. It is possible that in the future, if not at this time, the infestation within the zone of defense may reach such a magnitude that even with funds being available it would not be economically feasible to continue the original plan. In considering the possible success of this project attention must be given to the serious epidemic of the mountain pine beetle which exists in the lodgepole pine and yellow pine stands of central Idaho. This outbreak occurs throughout the Salmon, Challis, Idaho, and Payette National Forests. At this time there are scattered individuals and small groups of infested trees on the North Fork of the Salmon River, and a serious condition exists on the drainage of the Lemhi River. Both of these rivers are but a short distance to the west of the Big Hole Basin and it is possible that as the infestation develops in these regions it will spread into our zone of defense. Should this occur during the same years as a flight of beetles from the Bitterroot, it would perhaps prove to be physically impossible to cope with the

situation. I have been advised that timber stands are not available for the spread of this infestation into Montana south of the Big Hole Basin. However, a study of the forests of Idaho leads one to believe that the infestation from the Salmon Forest could spread through the Lemhi Forest into the Madison and Targhee National Forests as easily as from the Bitterroot, though on this point I have no positive information. Should this be true then in a continuation of the Big Hole project there would be a possibility of the Idaho infestation spreading to the rear of the defense zone and making of the project, regardless of how successfully it had checked the advance from the Bitterroot, a failure. To attempt to forecast the future of the Idaho outbreak is impossible. At this time it seems to exist as the same, though not quite as striking, potential danger as the Bitterroot with the exception that we already know that the latter is spreading to the south.

This situation seriously complicates recommendations for the continuance of the present project. Should we assume that within the next few years the Idaho infestation will spread into the areas south of our defense zone, then money spent in the Big Hole Basin at this time would be wasted. However, with the Bitterroot infestation we have a situation which we have conceded will spread into the timber stands of the south unless checked, while the Idaho outbreak is but a possibility. I dislike the idea of recommending that the project be discontinued on the strength of the Idaho outbreak, for as we now believe it would mean the sacrifice of the timber stands to the south by the Bitterroot infestation. However, the situation exists and must be recognized as a potential complication to the present plan of control.

If the value of the timber stands of the Park Service and Forest Service, which lie to the south of the Big Hole Basin, are sufficient to justify the expenditure necessary for the checking of the Bitterroot infestation, then, even with the knowledge of the possible danger of the Idaho outbreak, it is not believed to be sufficient justification for the discontinuance of the project. This position is taken due to the large sum of money which will be required for the continuation of the present project on the assumption that the Idaho situation did not exist. If the timber values at stake justify the possible expenditure of $500,000 or more in the next few years, then I feel that we are still further justified in taking a chance that the Idaho outbreak will not seriously complicate the present project. If smaller timber values were at stake this position would not be tenable.

Therefore, with the idea of stopping the southern spread of the Bitterroot infestation, it is recommended that the Big Hole Basin project be continued on the same basis as discussed in this memorandum,

as I feel that if the provisions of the plan of control are adequately carried out, there is a fair margin of safety on the side of the project being a success. The economics of the expenditure is another question which is apart from the field of the Bureau.

I will be glad to clarify any points not entirely clear or to furnish any additional information.

Respectfully submitted,

James C. Evenden

James C. Evenden
Associate Entomologist.

Wisdom, Montana,
Sept. 14th, 1927.

Refer to File
G.C. B-11.

Dr. F. C. Craighead,
Forest Entomologist,
Washington, D. C.

Dear Doctor Craighead:

As promised I am submitting a tentative outline giving the results of the extensive survey of the Big Hole Basin, as well as my reaction to the existing conditions. The figures which I am giving will no doubt be revised somewhat in my formal report, however such changes will not seriously change the total of 1927 attacked trees. The region has been divided into four areas which will be discussed separately. A map of the Beaverhead National Forest with the areas marked is enclosed which will perhaps help you to visualise the areas under discussion.

AREA # I - Region covered by control work in 1927.

In this area there were approximately 19.000 trees spotted on some 18.000 acres during the 1927 control season. Not all of the infested acerage was covered by the spotters which resulted in a large number of infested trees being left untreated. Our survey data shows that, with an increased acerage amounting to some 39.000 acres, there are approximately 25.537 - 1927 attacked trees. On the areas covered by 1927 control measures the infestation is not not as heavy as last year(This reduction will be computed later). This reduction is due to the control work coupled with the fact that there was a very light, if any at all, flight of beetles from the Bitterroot during the 1927 season. There were sufficient 1926 attacked trees left untreated within this area to account for the present infestation.

AREA # II - West side of Basin south of Area I. infested trees

Our data shows that there are some 18.672 in this area. The timber is ideal for insect attack and if the present infestation is left untreated a heavy infestation will soon develop.

AREA # III - East side of the Big Hole Basin.

In 1926 this area was covered by a red top survey only and at that time there were very few 1925 attacked trees (Red Tops) to be seen. During the 1926 season an increase in this infestation occured which I sincerely believe came from a flight of beetles into the area. At the present time there are small scattered groups of red tops throughout the area and our data shows that there are some 23,582 newly attacked trees. The infestation in this region is confined, for the most part, to the first two or three miles of timber within the forest boundary.

AREA # IV - Fish Trap-Wise River Area.

During the 1926 season a red top survey was made of this area which showed very few 1925 attacked trees. At this time there are small scattered groups of red tops (1926 Attacks) throughout the area. No sample strip was run in this area and the number of 1927 attacked trees, which is set at 3,000, is an estimation only.

I am rather sure that these figures will prove to be conservative as I do not think I have included all of the infested acerage. To tabulate the data for the different areas we have the following:

Area	1927 attacked trees
Area # I - 1927 Control Area	25,537
Area # II- West side of Basin S. of I	15,672
Area # III-East side of Basin	23,582
Area # IV -Fish Trap Wise River	3,000
Total	67,791

In brief the situation looks a trifle more discouraging than ever before. During the past two seasons we have lost rather than held our ground. I felt sure that we would find conditions as we did, but yet I kept hoping that I would be mistaken. To carry on the plan of control as agreed upon in 1925, which was to treat all of the infested trees within the Big Hole Basin for a number of years, we will require $100,000 for the work in 1928. To start with a smaller sum would only mean our retreating to the East Side of the Basin and to the head of the infestation west of the town of Jackson. This would only result in a postponement of the inevitable for as soon as the areas abandoned built into a heavy infestation, which they would, we would again be confronted with the same situation as we now face and would be obliged to retreat once more. To continue control work in the same area as last year and allow the advance areas to go untreated would result in our finding our selves surrounded by heavy infestations in a very few years, and our objective lost.

We can rest assured that the few miles of open fields between the east and west sides of the basin will not act as a barrier to the spread of the insects, no more than the Continental Divide has done in the past. However I do feel that the later, though it is not an absolute barrier has been of some help to us in preventing the southern spread. I mention these points as I feel that if we abandon the present zone of defense which we have adopted we will be lossing the advantage of the Continental Divide which may be of more help to us than we imagine in checking the southern spread of the Bitterroot infestation.

In all of my reports and correspondence dealing with this project I have stressed the fact that large sums of money would be required if any success was to be gained. In my report of last season I requested an allotment of some $80.000 and stated that a still larger sum would be required for the season of 1928. The project was entered into and carried on with that understanding and it seems that we have reached the point where we require the large sum of money. My personal feeling is just as it has always been that the only chance of success in this project lies in the treatment of all the infested trees within the Basin for an unknown number of years, or until the source of supply has been exhausted. To continue in the future as we have in the past is I am afraid merely the throwing of good money after bad.

Personnally I feel that nearly all of the experimental features of this project have been exhausted. We know that the infestation spreads and that the Continental Divide will not act as an absolute barrier. We also know that unless the advance groups of infested trees are treated there will be other advance groups a few miles further on the following year. These features, with this infestation, I can no longer consider as possibilities.

Nature may lend a helping hand, for she seems to have been working against us for a rather long time, with the result of our project being considered a great success. However if such an event is going to occur then there is no need for control work, for if the tremendous number of infested trees which are adjacent to this project in both Idaho and Montana can be cared for in this manner, then the very small percent which we could treat would be of little assistance. Perhaps a hinderance due to the destruction of benificial insects by fire in our control work.

Bitterroot Protective Association

#I 1927 Control Area 25537 Trees

#II

#III 23,582 Trees.

#IV 5000 Trees

Eastern Advancee of Idaho Infestation

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
W. B. GREELEY, FORESTER

BEAVERHEAD NATIONAL FOREST
MONTANA
MONTANA PRINCIPAL MERIDIAN
1921

Scale 1 0 1 2 3 4 5 Miles

NATIONAL FOREST BOUNDARY
ADJACENT NATIONAL FOREST BOUNDARY
NORTH AMERICAN DATUM

Longitude West from Greenwich

Compiled in District Office, Missoula, 1920 from U. S. G. S., G. L. O., Forest Service, and other surveys
By H. H. Kuchler
Traced 1921 at District Office by K. O. Swan

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